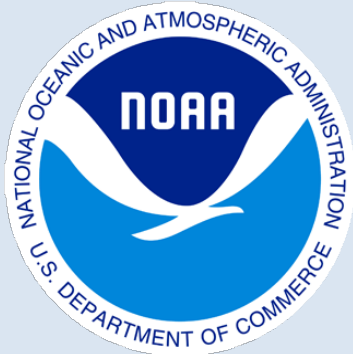


NOAA Climate Science & Services

Monthly Climate Update



Deke Arndt

Chief, Monitoring Section, NOAA National Centers for Environmental Information

Rick Thoman

Climate Specialist, Alaska Center for Climate Assessment and Policy

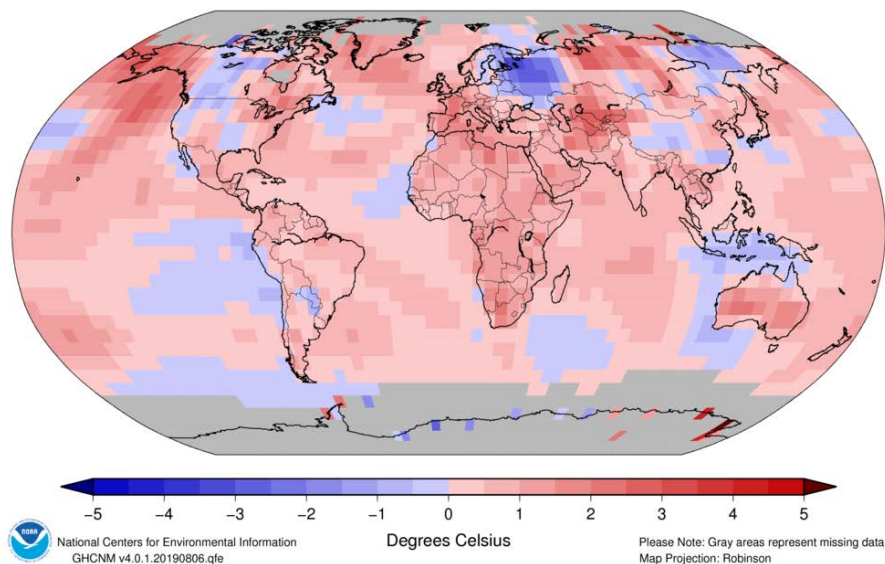
Brad Pugh

Meteorologist, NOAA Climate Prediction Center

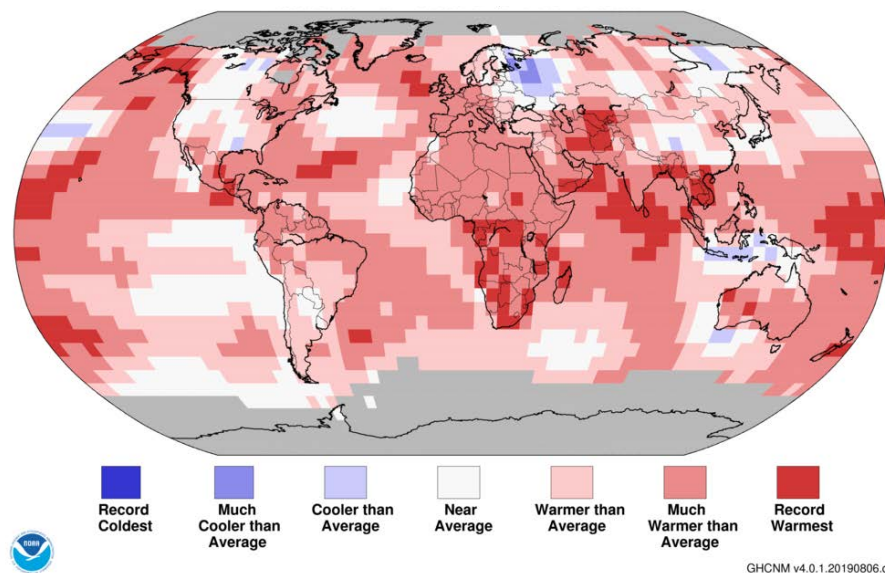
Global Climate: July 2019

0.95°C / 1.71°F warmer than 20th century average, warmest July

Temperature Departures
vs. 1981-2010 average for July



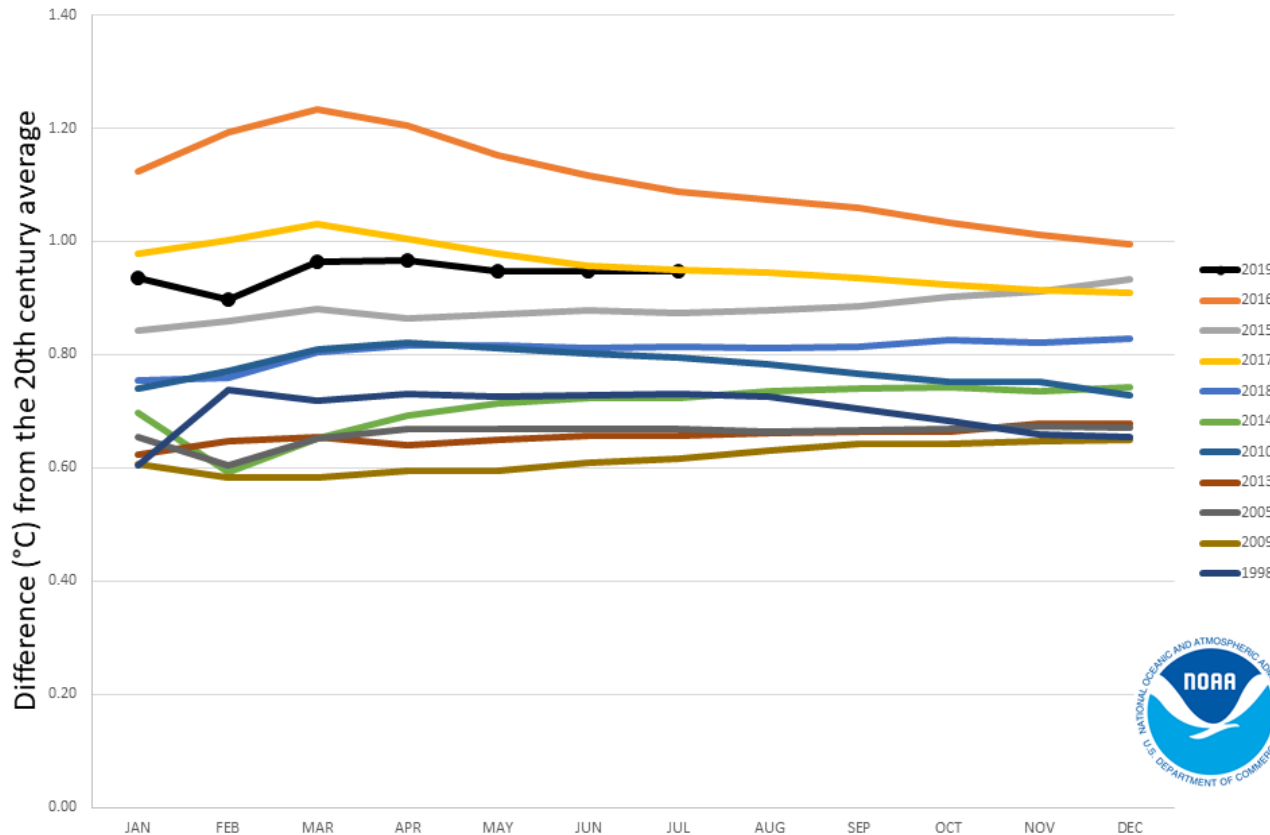
Temperature Percentiles for July
Period: 1880-2019 (140 years)



- **Land:** 1.23°C (2.21°F) above 20th century; 2nd warmest July (to 2017)
- **Ocean:** 0.84°C (1.51°F) above 20th century; warmest July; 6th largest monthly anomaly
- **Year-to-date:** 0.95°C (1.71°F) above 20th century; 2nd warmest (to 2016)

2019 global temperature in context

Year-to-Date Global Temperatures
for 2019 and the ten warmest years on record



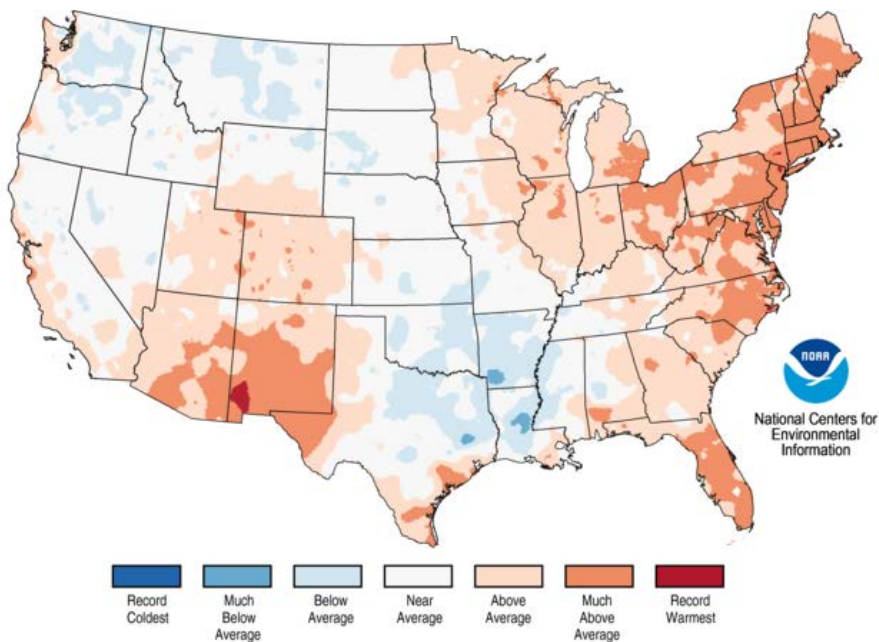
- 100.0% chance of a top 10 year
- 100.0% chance of a top 5 year
- Most likely: 2nd to 4th warmest year

Contiguous U.S. July 2019

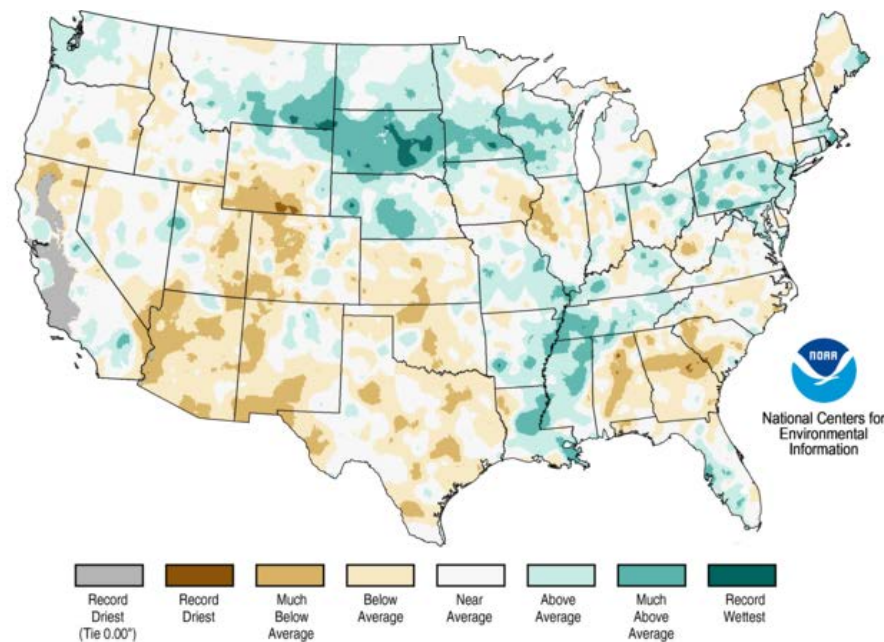
Temperature: 74.6°F, +1.0°F, “warmer than average”

Precipitation: 2.69”, -0.09”, “near average”

Temperature Percentiles July 2019
Period: 1895-2019 (125 years)



Precipitation Percentiles July 2019
Period: 1895-2019 (125 years)



- Warmth, regionally: Four Corners, and from Great Lakes into the Atlantic Coast
- Cooler: Northwest to the Plains and into the ArkLaTex
- Roughly 2-to-1 ratio of warm records vs. cold records

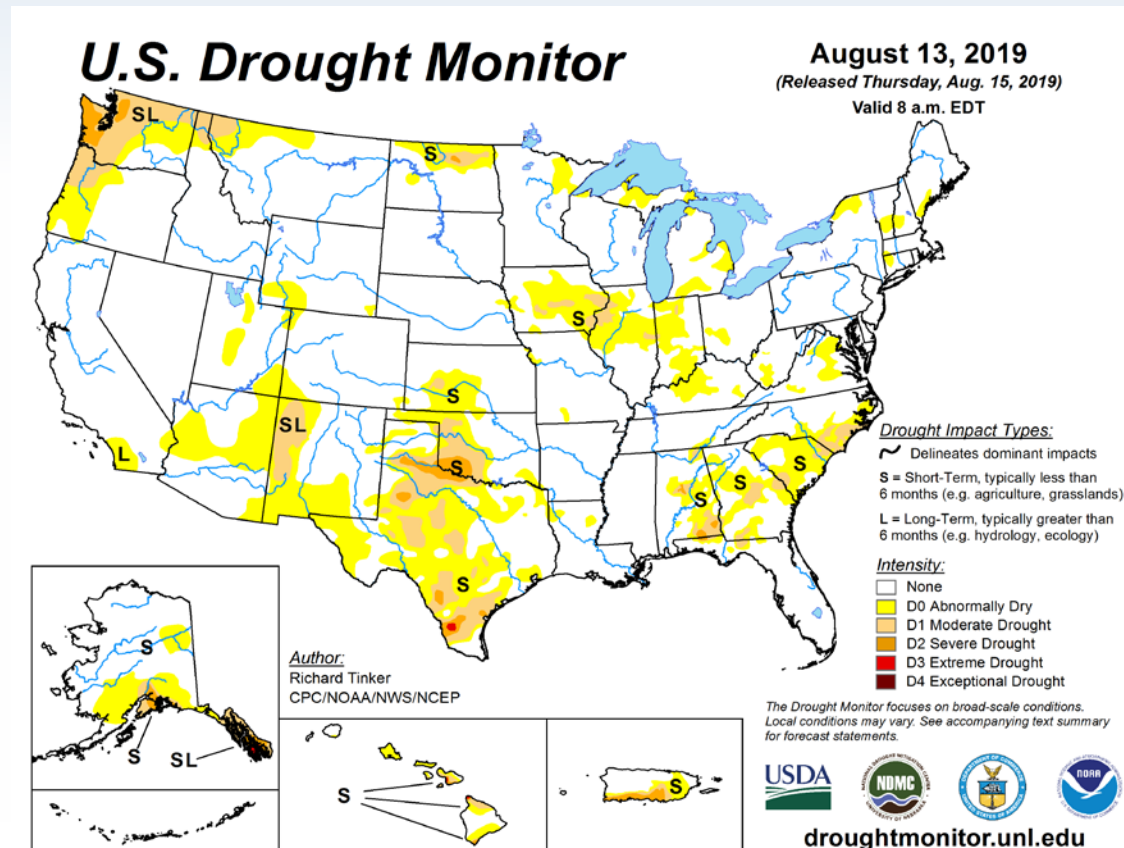
- Northwest, Northern Rockies, Central to Southern Plains, and Great Lakes were wetter than average
- Dry in the Southwest, southern plains and southeast
- Hurricane Barry: landfall July 13th. Localized flooding and localized historic rainfall in LA, AR.

Current U.S. Drought

6.2% of Contiguous U.S. in Drought

(3.0 percentage points more than late June)

- Improvements: Big Island of Hawaii, small pieces throughout CONUS
- Degradation: Southern Plains and Midwest

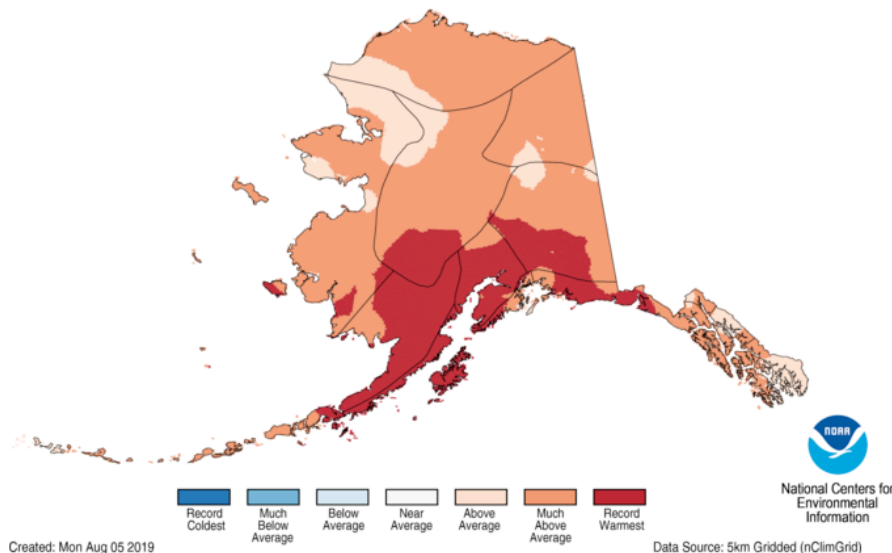


Alaska 2019: Land of Extremes

Maximum Temperature Percentiles

July 2019

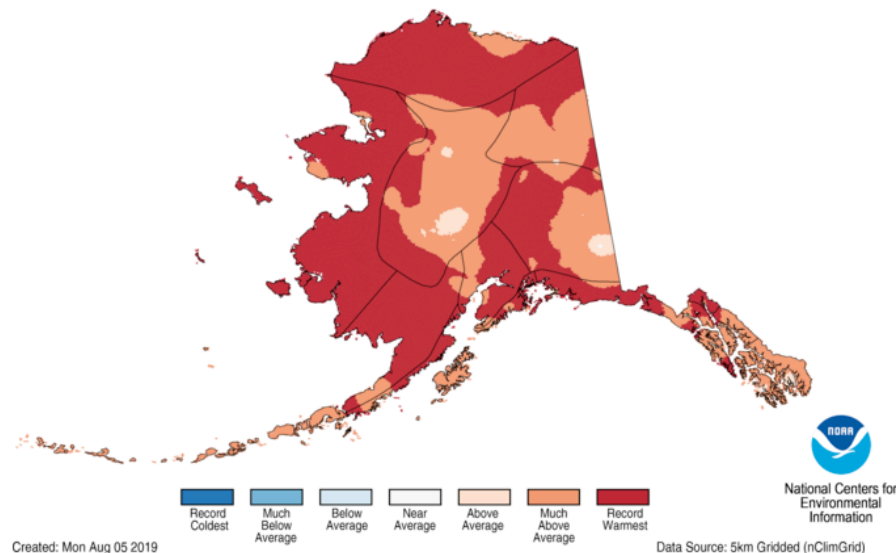
Ranking Period: 1925–2019



Minimum Temperature Percentiles

July 2019

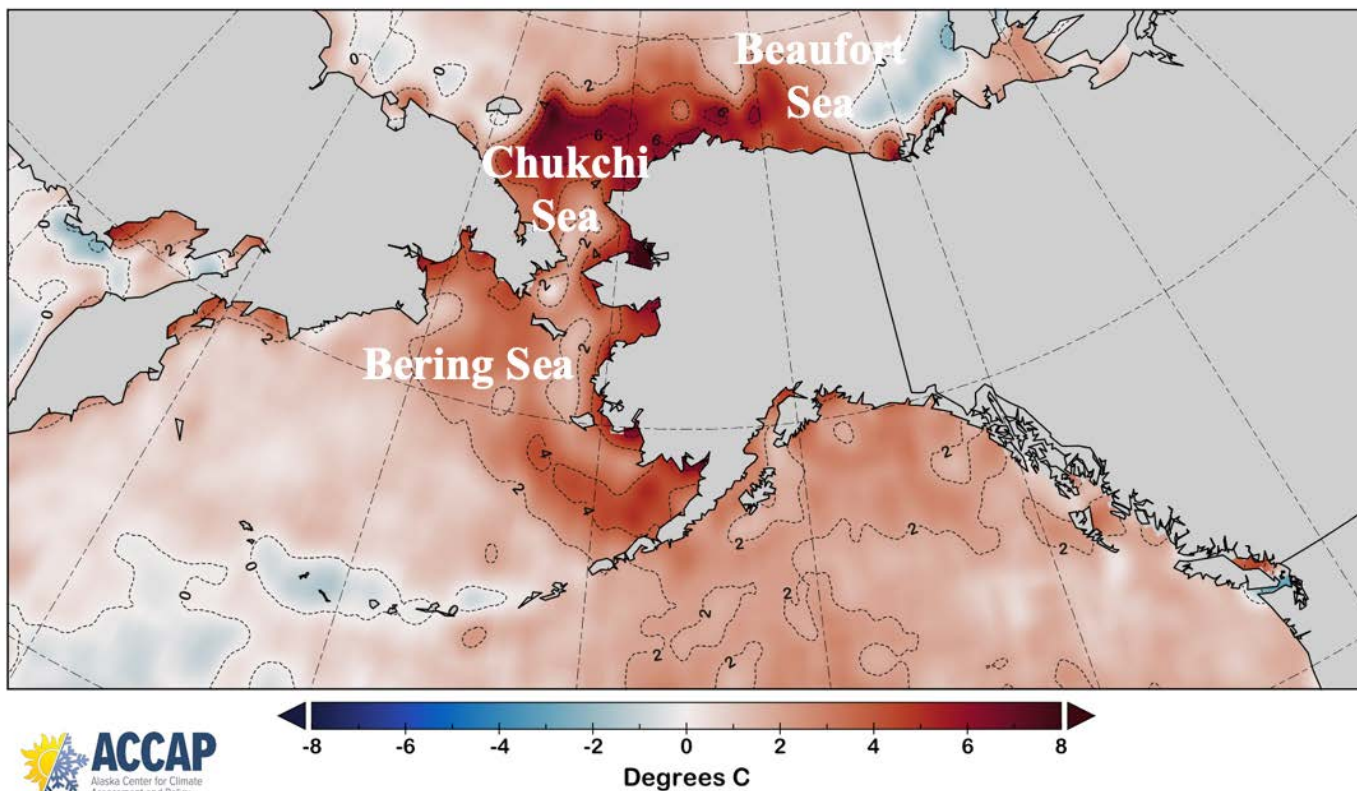
Ranking Period: 1925–2019



- July: warmest month (not just July) of record
- All-time record high temperatures Bristol Bay to Interior (600 miles)
- Follows the warmest spring of record
- Drought in Panhandle, Southcentral and northwest Interior
- Big wildfire season (2.44 million acres)

Alaska Ocean Extremes

Average Sea Surface Temperature Departure from Normal
July 2019



OISSTv2 courtesy of NOAA/PSD/ESRL

- **Early summer:** record warm oceans around Alaska
- **Bering sea:** ice collapse February and March
- **Chukchi Sea:** record low ice extent most of the time since May
- **Beaufort Sea:** near record low ice extent since May

Why does this matter?

Short term:

- Southeast hydropower shutdowns continue
- Health impacts and concerns from wildfire smoke far from fires
- “Multi-species” mortality in Bering Strait region (sea birds, seals, walrus)
- Salmon die-offs/delays around Alaska (multiple factors likely)
- Warm/dry weather related insect damage to trees (e.g. spruce bark beetle, hemlock sawfly)

Long Term:

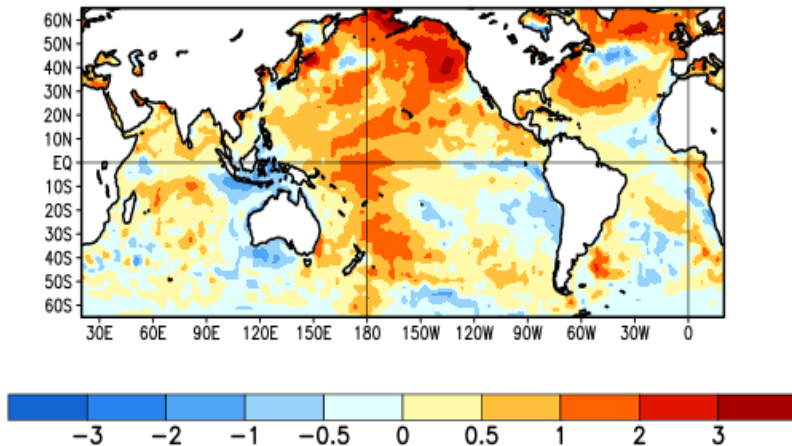
- Warm waters north of the Bering Strait certain to result in late ice-over of Chukchi and Bering Seas
- Rapid changes in northern Bering Sea ecosystem due to loss of spring sea ice and cold bottom water



Anchorage in smoke from Swan Lake Fire.
Courtesy KTVA

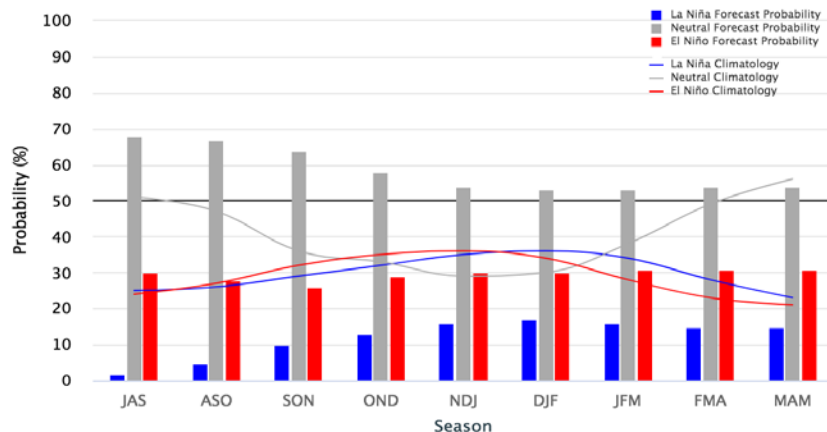
Sea Surface Temperatures & ENSO

Average SST Anomalies
14 JUL 2019 – 10 AUG 2019



Early-August 2019 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C



Sea surface temperatures

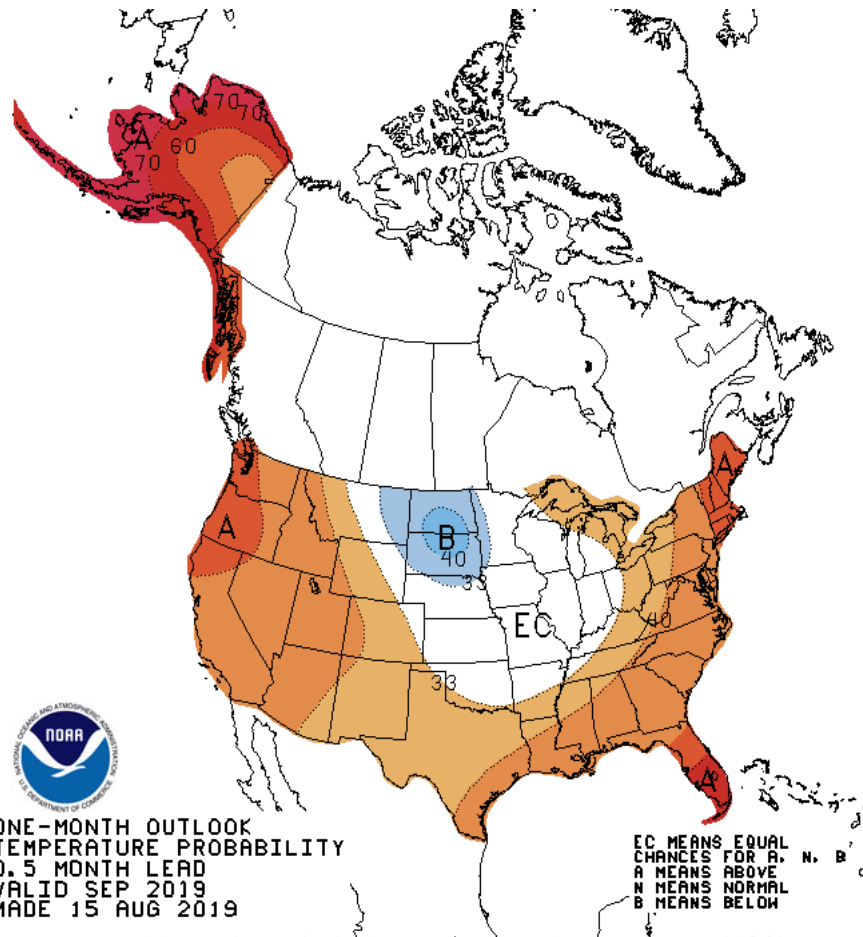
- Above normal SSTs persist in the central equatorial Pacific
- Below normal SSTs developed in the eastern equatorial Pacific
- North of the equator, above normal SSTs present across the east Pacific
- Oceanic and atmospheric conditions reflect a transition to ENSO-neutral

ENSO forecast

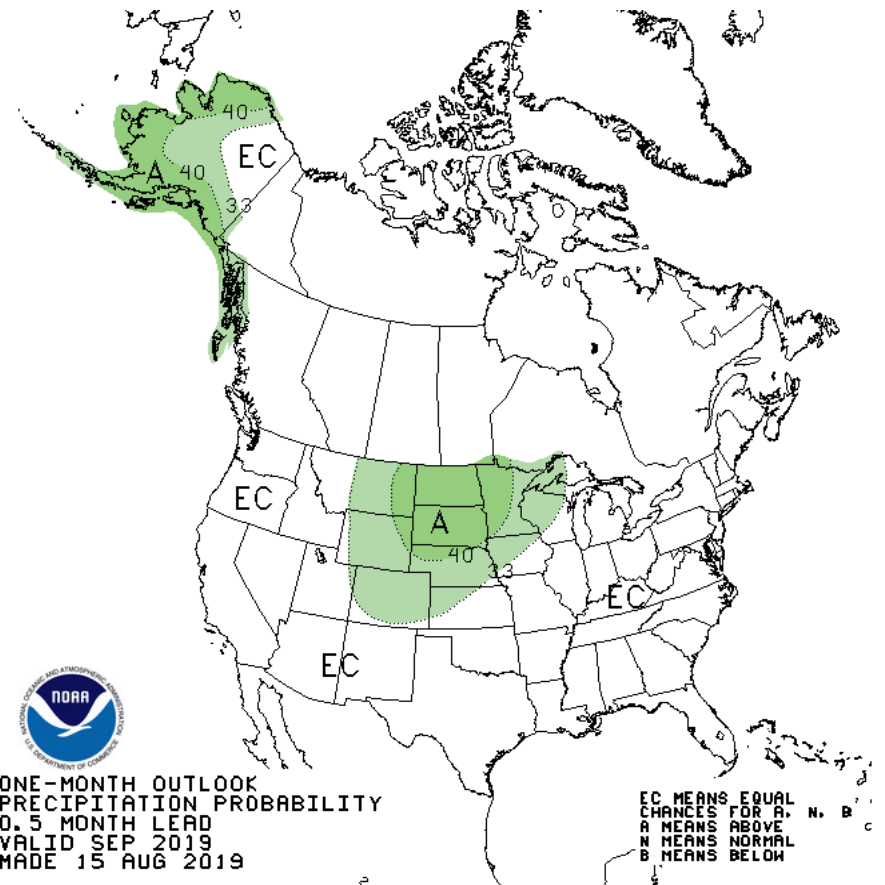
- ENSO-neutral is probable through winter 2019-2020
- Uncertainty is high on ENSO evolution during the next several months
- La Niña is the least likely outcome

Monthly Forecast (September)

September Average Temperature Probability

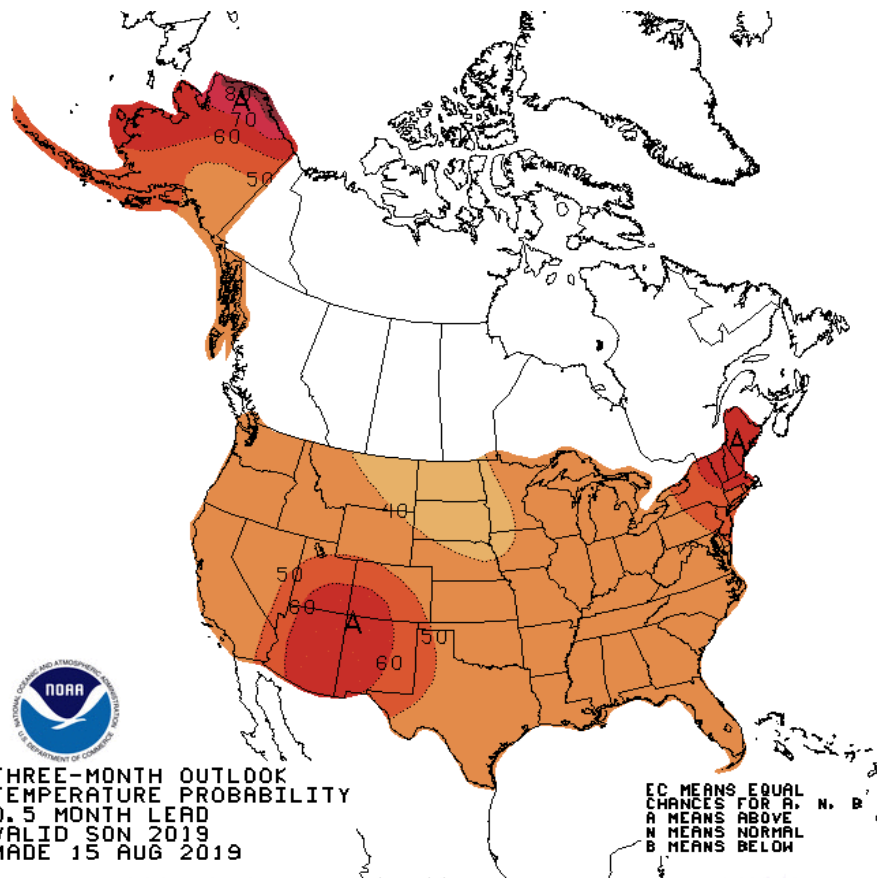


September Total Precipitation Probability

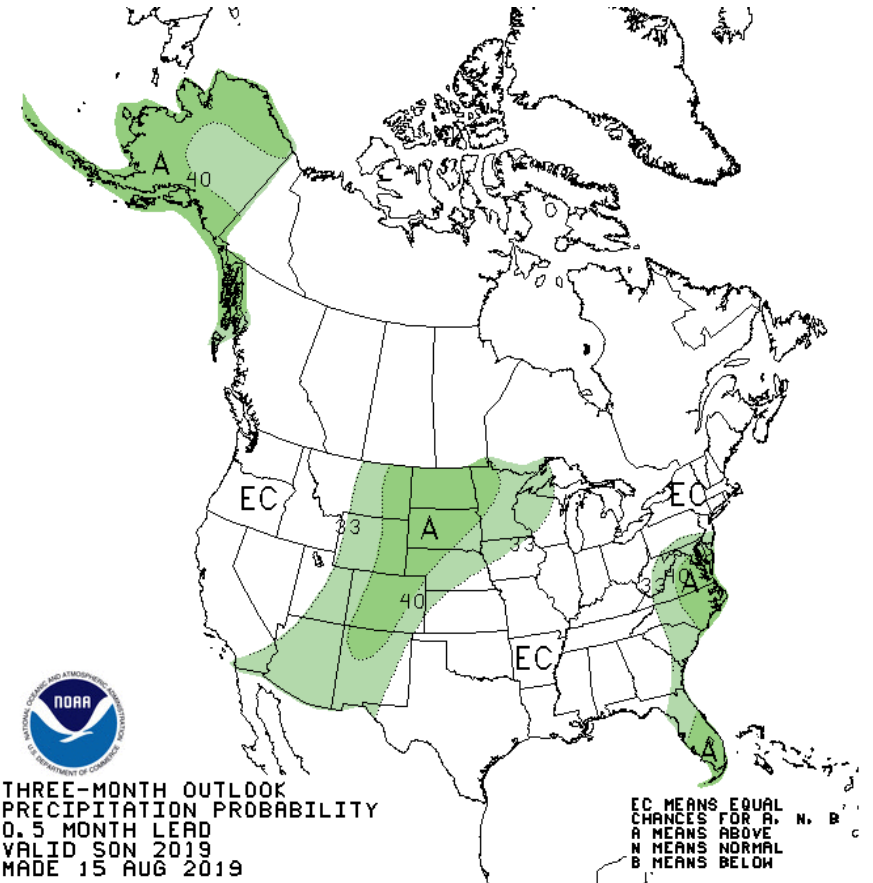


Seasonal Forecast (Sept.-Oct.-Nov.)

Sep-Oct-Nov Average Temperature Probability



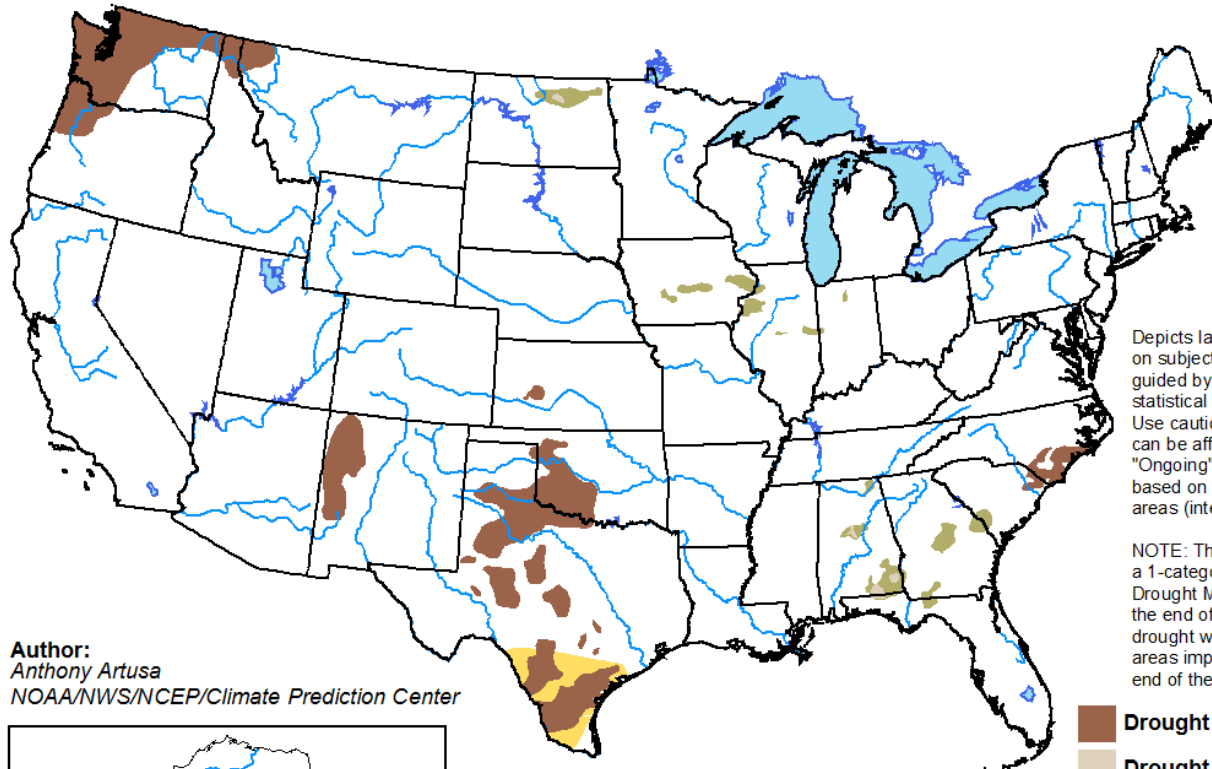
Sep-Oct-Nov Total Precipitation Probability



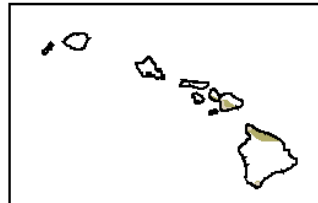
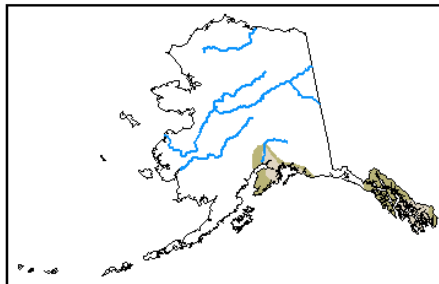
U.S. Drought Outlook

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for August 15 - November 30, 2019
Released August 15







Author:
Anthony Artusa
NOAA/NWS/NCEP/Climate Prediction Center



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

-  Drought persists
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely



<http://go.usa.gov/3eZ73>

For More Information



TODAY'S PRESENTATION:

- <http://www.ncdc.noaa.gov/sotc/briefings>

NOAA's National Centers for Environmental Information:

www.ncdc.noaa.gov

- Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- Dates for upcoming reports: <http://www.ncdc.noaa.gov/monitoring-references/dyk/monthly-releases>

NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov

Alaska Center for Climate Assessment and Policy: <https://accap.uaf.edu/>

U.S. Drought Monitor: <http://drought.gov>

Climate Portal: www.climate.gov

NOAA Media Contacts: lauren.gaches@noaa.gov, 301-683-1327 (NOAA Communications/HQ)